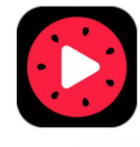


# JVET-AG0120

## Non-EE2: On line buffer restriction

Zhipin Deng, Kai Zhang, Li Zhang  
ByteDance Inc.



# Motivation

- When derive reconstruction samples or motion info outside the current CTU, there is a line buffer restriction:
  - one line (VVC) → much more than one line (ECM)

**Table 1. The line buffer requirement of coding tools in ECM-11.0**

Coding methods in ECM-11.0	Require more than one line buffer?
CCCM/NS-CCCM/GL-CCCM/MDF-CCCM	Yes
DIMD template	Yes
TIMD template	Yes
Template in interTM merge mode	Yes
Intra MPM: non-adjacent spatial candidates	Yes
Inter/IBC/affine motion: non-adjacent spatial candidates	Yes
Intra/Inter CCP merge: non-adjacent spatial candidates	Yes
intraTMP/IBC search region	Yes
Extended MRL	No
Template based MRL	No
Intra luma fusion	No

# Proposal

- It is proposed to remove the line buffer restriction for all coding tools in ECM in a consistent way
- Simulation results

	All Intra Main 10						
	Over ECM-11.0						
	Y	U	V	EncT	DecT	EncVmPeak	DecVmPeak
Class A1	-0.03%	0.00%	0.04%	100.5%	100.3%	99.9%	99.9%
Class A2	-0.01%	0.11%	0.02%	100.1%	99.6%	100.0%	100.0%
Class B	-0.05%	0.12%	-0.09%	100.5%	100.0%	100.0%	100.0%
Class C	-0.06%	-0.02%	0.13%	100.3%	100.9%	99.6%	100.0%
Class E	-0.07%	0.10%	0.00%	100.4%	100.6%	100.0%	100.0%
<b>Overall</b>	-0.05%	0.06%	0.02%	100.4%	100.3%	99.9%	100.0%
Class D	-0.03%	-0.04%	-0.07%	100.1%	100.0%	100.0%	100.0%
Class F	-0.04%	-0.15%	0.17%	99.9%	100.1%	100.0%	100.0%
	Random Access Main 10						
	Over ECM-11.0						
	Y	U	V	EncT	DecT	EncVmPeak	DecVmPeak
Class A1	-0.03%	-0.05%	-0.04%	100.0%	99.7%	100.4%	100.3%
Class A2	0.00%	-0.02%	0.01%	100.3%	100.5%	99.8%	100.0%
Class B	0.00%	0.05%	-0.03%	100.4%	100.2%	99.4%	100.1%
Class C	-0.01%	-0.08%	-0.13%	100.7%	99.8%	100.0%	100.1%
Class E							
<b>Overall</b>	-0.01%	-0.02%	-0.05%	100.4%	100.0%	99.8%	100.1%
Class D	0.00%	0.11%	0.16%	100.7%	99.4%	99.9%	100.0%
Class F	-0.05%	-0.13%	-0.21%	100.6%	100.9%	99.6%	99.9%

# Conclusions

- This proposal presents the results of a consistent design of line buffer usage
  - BD-rate gain of 0.05% in AI and 0.01% in RA
  - Negligible complexity change
- It is recommended to further study the proposed method in next EE

Thank OPPO (JVET-AG0263) for crosschecking!